Nuclear Energy Research Initiative (NERI)

March 2002

Background

In January 1997 the President tasked his Committee of Advisors on Science and Technology (PCAST) to evaluate the current national energy research and development (R&D) portfolio and provide a strategy to ensure the U.S. has a program to address the nation's energy and environmental needs for the next century.

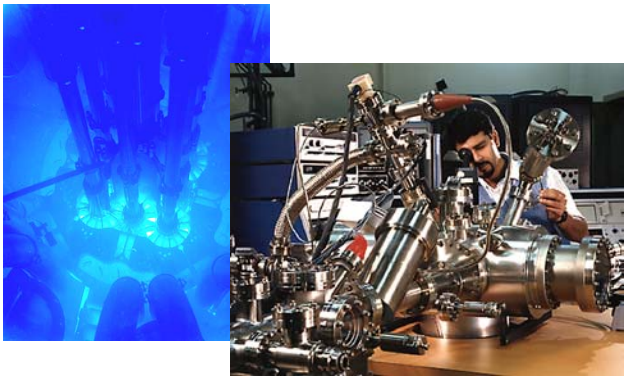
In its November 1997 report, the PCAST Panel on Energy Research and Development determined that establishing nuclear energy as a viable and expandable option was important and that properly focused R&D was needed to address the potential long-term barriers to expand the use of nuclear power (*e.g.*, nuclear waste, proliferation, safety and economics). The PCAST panel recommended that the Department of Energy (DOE) reinvigorate its nuclear energy research and development activities in an R&D effort to address these potential barriers with a new Nuclear Energy Research Initiative (NERI). This new initiative would fund research based on competitive selection of proposals from the national laboratories, universities and industry.

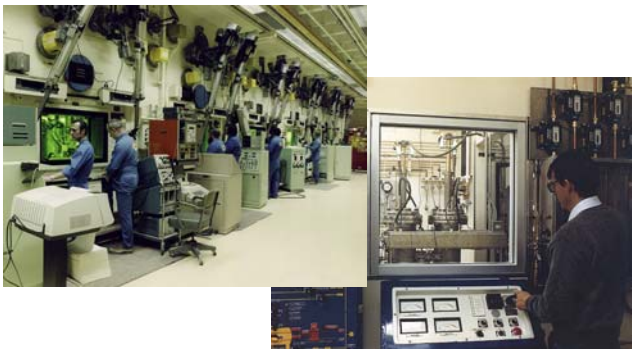
The Department and Congress endorsed the PCAST recommendations and established the NERI program in fiscal year (FY) 1999 to sponsor innovative scientific and engineering R&D to address the key issues affecting the future use of nuclear energy and to advance U.S. leadership in nuclear science and technology.

NERI Objectives

To achieve these long-range goals, the NERI program has the following objectives:

- Develop advanced concepts and scientific breakthroughs in nuclear fission and reactor technology to address and overcome the principal technical obstacles to the expanded use of nuclear energy;
- Advance the state of nuclear technology in the U.S. to maintain a competitive position in overseas markets and a future domestic market; and





- Promote and maintain a nuclear science and engineering infrastructure to meet future technical challenges.

Research Areas

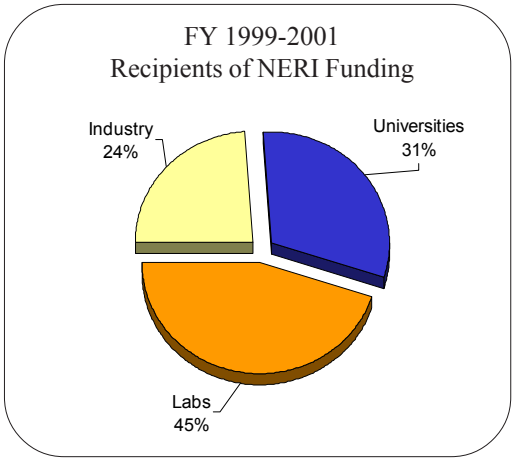
The NERI program conducts innovative scientific and engineering research and development in areas such as:

- Proliferation-resistant reactors and fuel cycles;
- Next generation nuclear energy systems which feature higher efficiency, lower cost, and improved safety to compete in the global market (*i.e., Generation IV*);
- Generation of economic hydrogen to support cleaner, more efficient use of energy;
- Advanced nuclear fuels;
- New technologies for management of nuclear waste; and
- Fundamental nuclear science.

NERI features a *competitive, peer-reviewed R&D selection process to fund researcher-initiated R&D proposals* from universities, national laboratories and industry.

Nuclear Energy Research Advisory Committee

To help guide the Department's nuclear R&D and shape the future direction of the nuclear technology program, in November 1998, the Secretary of Energy established an independent advisory committee, the Nuclear Energy Research Advisory Committee (NERAC). NERAC chartered subcommittees have developed a series of important reports and plans to guide the Department's activities, including the *Long-Term Nuclear and Technology Research and Development Plan* which guides Federal nuclear energy research out to the year 2020.



Major Program Accomplishments (FY 1999-2001)

- In the first 3 years of the program, awarded 69 investigator initiated, peer reviewed, merit selected NERI research projects in nuclear science and technology representing over $79 million in research over the three year project durations.
- The 69 NERI projects fund research at 53 U.S. research organizations including 24 universities, 9 national laboratories, and 20 industrial organizations.
- NERI has stimulated significant international interest in U.S. nuclear research with the collaborative involvement of 24 international R&D organizations in the current NERI projects at no cost to the Federal government.
- In FY 2001 the first Annual Report was issued.
- The International Nuclear Energy Research Initiative (I-NERI) program was established in FY 2001 to conduct bilateral research to improve the cost and enhance the safety, nonproliferation and waste management of future nuclear energy systems.

FY 2002 Planned Accomplishments:

- Complete 43 NERI R&D projects initiated in FY 1999.
- Continue 23 R&D projects awarded in FY 2000 and FY 2001.
- Award approximately 16 new merit-based, peer-reviewed NERI projects
- Continue the I-NERI program conducting cooperative research with international partners.

FY 2003 Planned Accomplishments:

- Complete 10 NERI R&D projects initiated in FY 2000.
- Continue 13 R&D projects initiated in FY 2001 and the 16 projects initiated in FY 2002.

Program Budget
NERI
($ in Millions)

FY 2001 Appropriation	FY 2002 Appropriation	FY 2003 Request
$33.9[1]	$32.0[2]	$25.0[3]

[1]Includes $6.8 million for I-NERI
[2]Includes $7.8 million for I-NERI
[3]Includes $8.3 million for I-NERI

Research Areas	Number of New Awards FY 1999	FY 2000	FY 2001
Proliferation-Resistant Reactors and/or Fuel Cycles	5	1	--
Advanced Reactor Technologies			
Advanced Reactor Design	7	5	4
Economics, Safety & Other	5	1	1
Instrumentation	6	2	2
Advanced Nuclear Fuel	5	--	2
Nuclear Waste Management	5	--	--
Fundamental Nuclear Science	13	1	4
Total	**46**	**10**	**13**